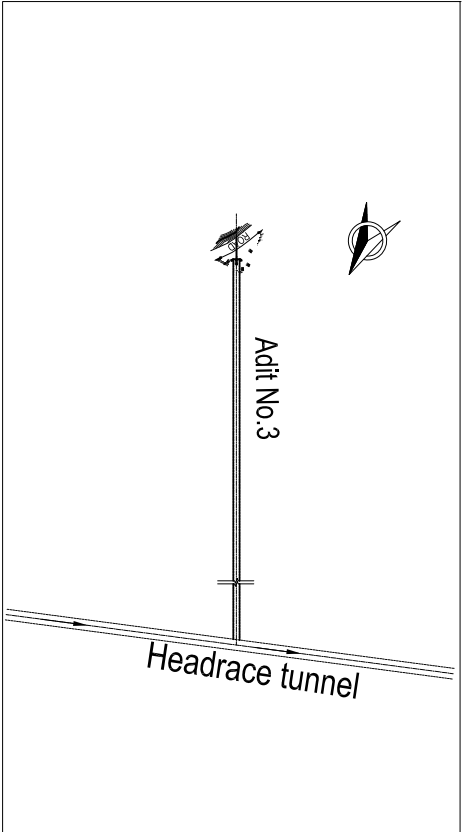
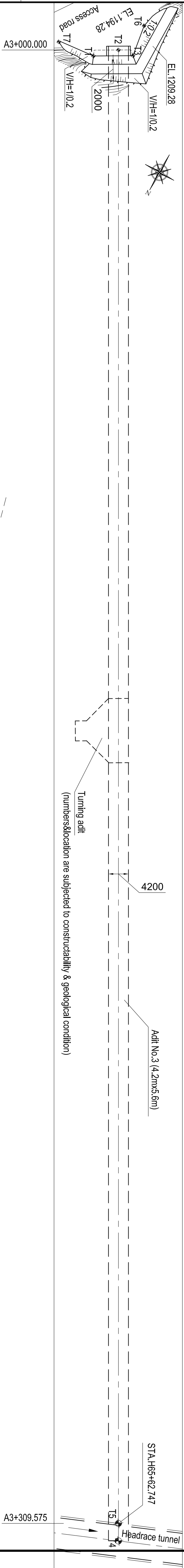


KEY PLAN



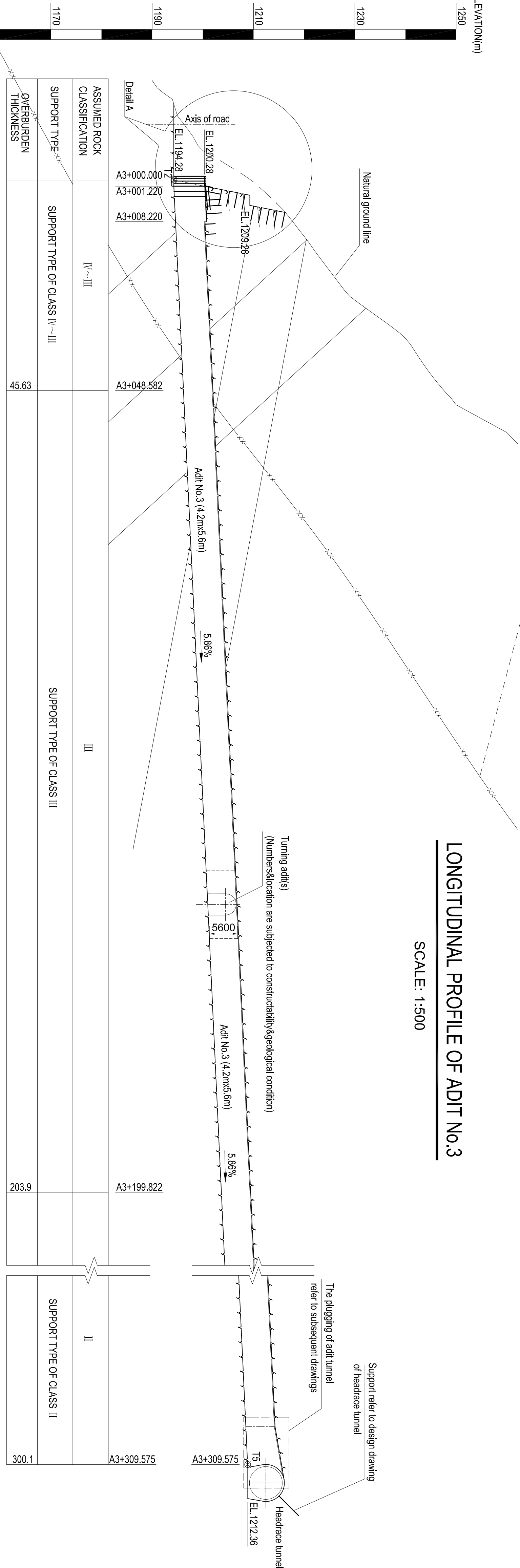
GENERAL PLAN LAYOUT OF ADIT NO.3

SCALE: 1:500



LONGITUDINAL PROFILE OF ADIT NO.3

SCALE: 1:500



Legend

ID	Occurrence
1	J15 280°-60°
2	J16 40°28°
3	Foliation 290°~340°/15°~30°



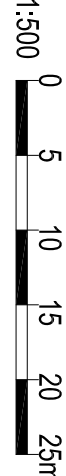
Control points

No.	Coordinates(m)		EL.(m)
T1	N(m)	E(m)	1194.28
T2	3108930.680	622312.158	1194.28
T3	3108927.093	622308.124	1194.28
T4	3108926.709	622304.867	1194.28
T5	3109203.146	622160.038	1213.36
T6	3109199.899	622161.779	1213.36
T7	3108920.051	622305.778	1194.28
T8	3108931.518	622319.961	1194.28

NOTE

- 1.This set of drawings are excavation and initial support of No.3 adit.
- 2.All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
- 3.The designer shall provide alternatives and options in the tunnel support design, so that the support can be adjusted in case geological conditions are varying.
- 4.The end position of the adit No.3 may be adjusted according to the final design of the headrace tunnel.
- 5.These rock classes and length estimates in drawings are purely speculative, and all rock classes may be encountered.

Scale:



REFERENCE DRAWINGS

UT1-C-159-CU-30-43002	Surrounding Rock Stability Evaluation of Adit No.3
UT1-C-000-CU-30-40001-01-05	Detailed Design Drawing of Excavation and Support for Underground Cavern
UT1-C-945-CU-40-30005	Layout Drawing of Ventilation for Adit No.3
UT1-C-159-CU-30-43009	Drawing of construction unit NO.3 plugging

SYMBOL AND LEGEND

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D	10.EC. 2021	FOR APPROVAL	DONG Z.Z.	Lei Y.G.	Hou J.B.
C	10.SEP. 2021	FOR APPROVAL	DONG Z.Z.	Lei Y.G.	Hou J.B.
B	25.JUL. 2021	FOR APPROVAL	DONG Z.Z.	Lei Y.G.	Hou J.B.
A	25.MAY. 2021	FOR APPROVAL	DONG Z.Z.	Lei Y.G.	Hou J.B.

PROJECT TITLE
Upper Trishuli-I HEP (216MW)

OWNER



OWNER'S ENGINEER



CONTRACTOR

DOOSAN Heavy Industries & Construction

DRAWING TITLE
EXCAVATION AND INITIAL SUPPORT DRAWINGS
OF ADIT NO.3 (1/5)

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CVL-DG-43004	1 OF 5	F

NOTE

SCHEMATIC DIAGRAM OF OPEN TUNNEL

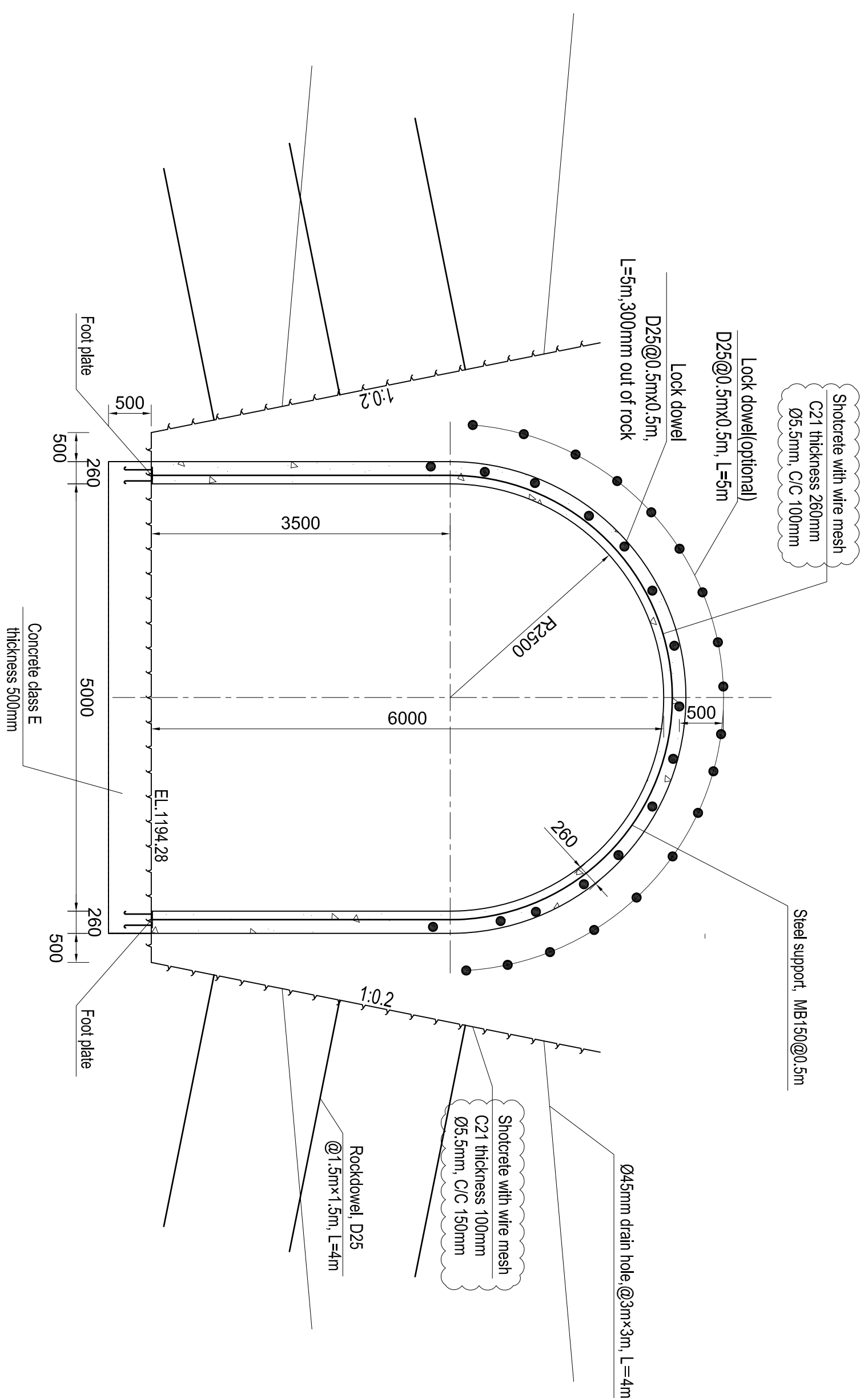
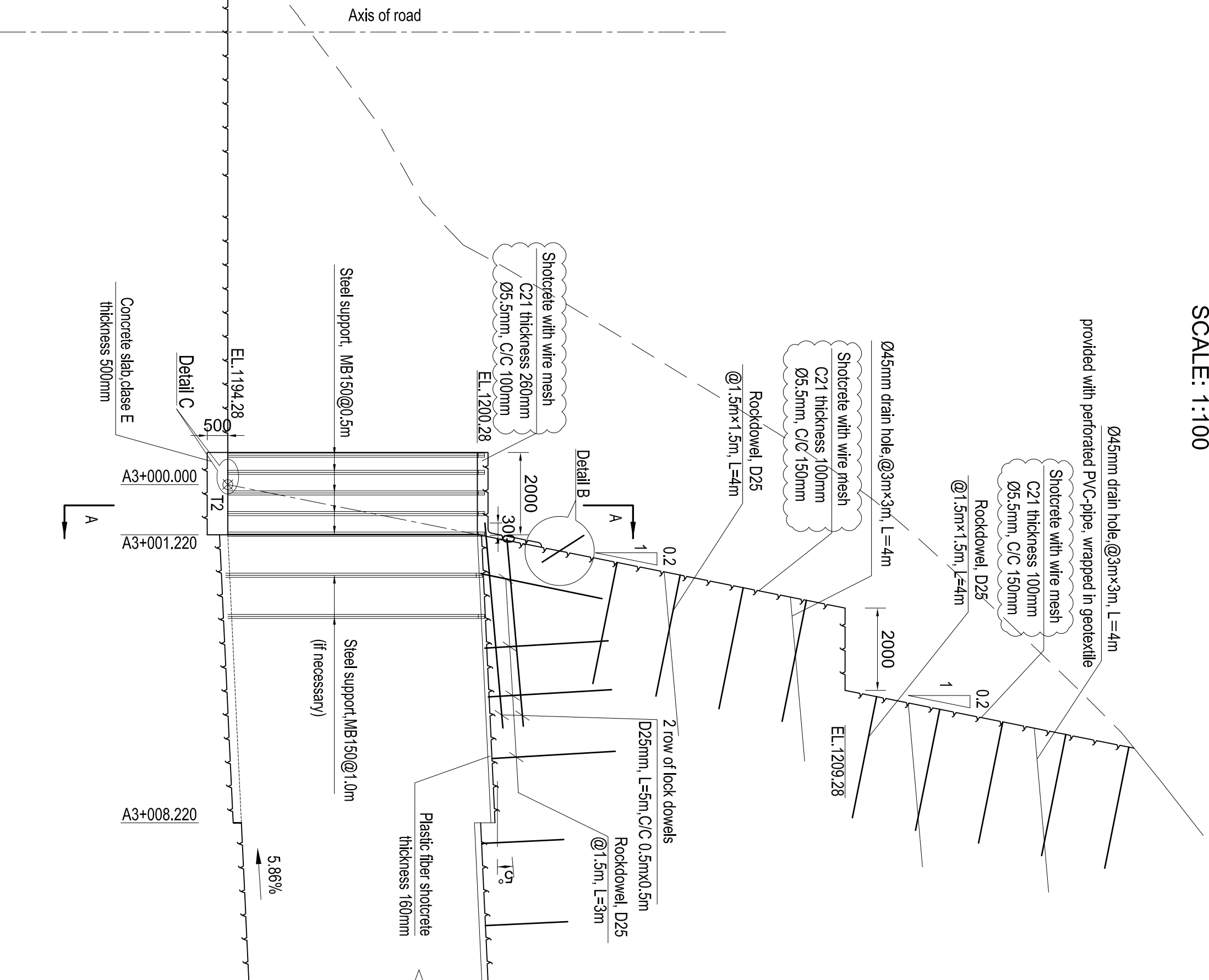
(SECTION A-A)

SCALE 1:50

Detail A

SCALE: 1:100

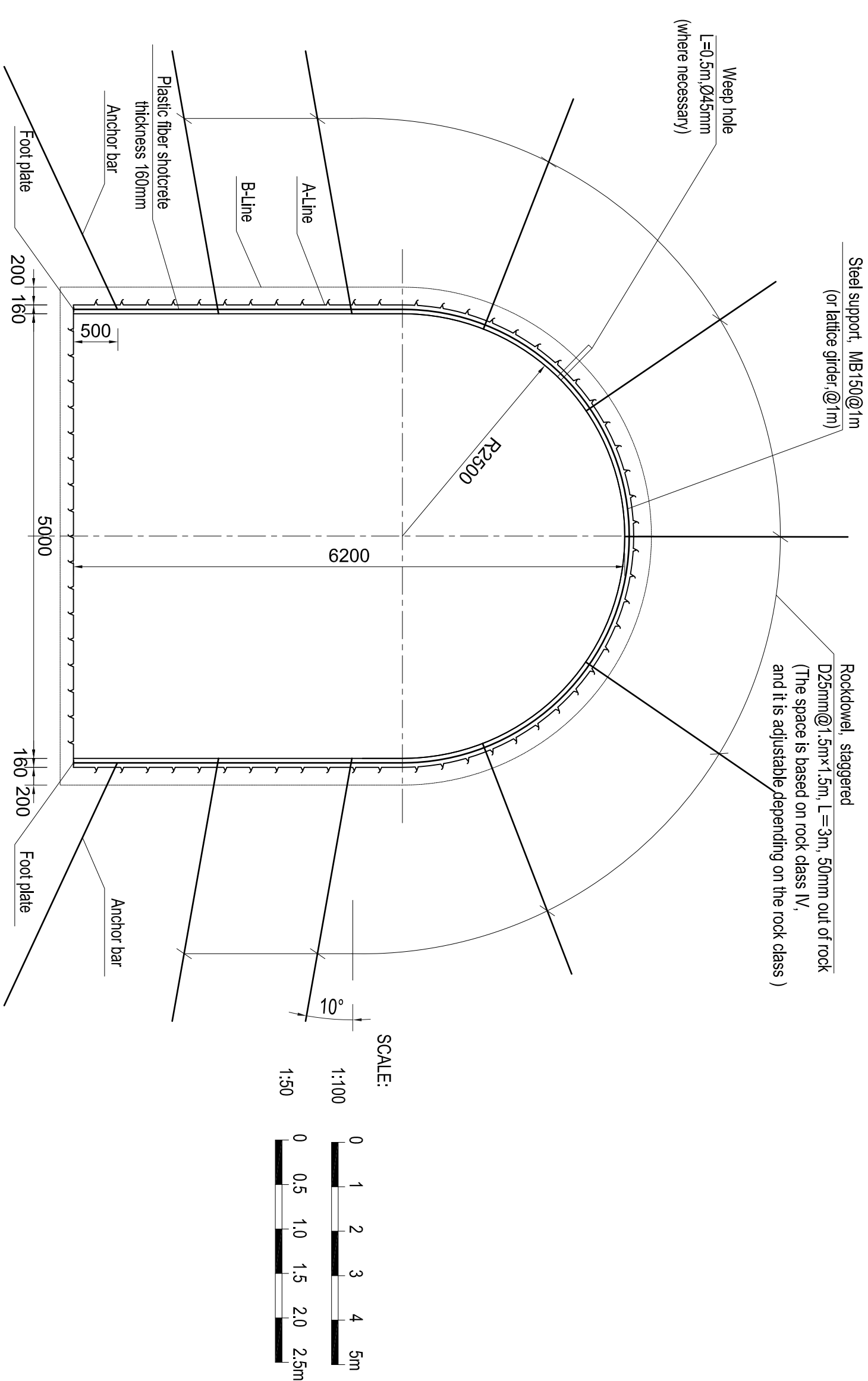
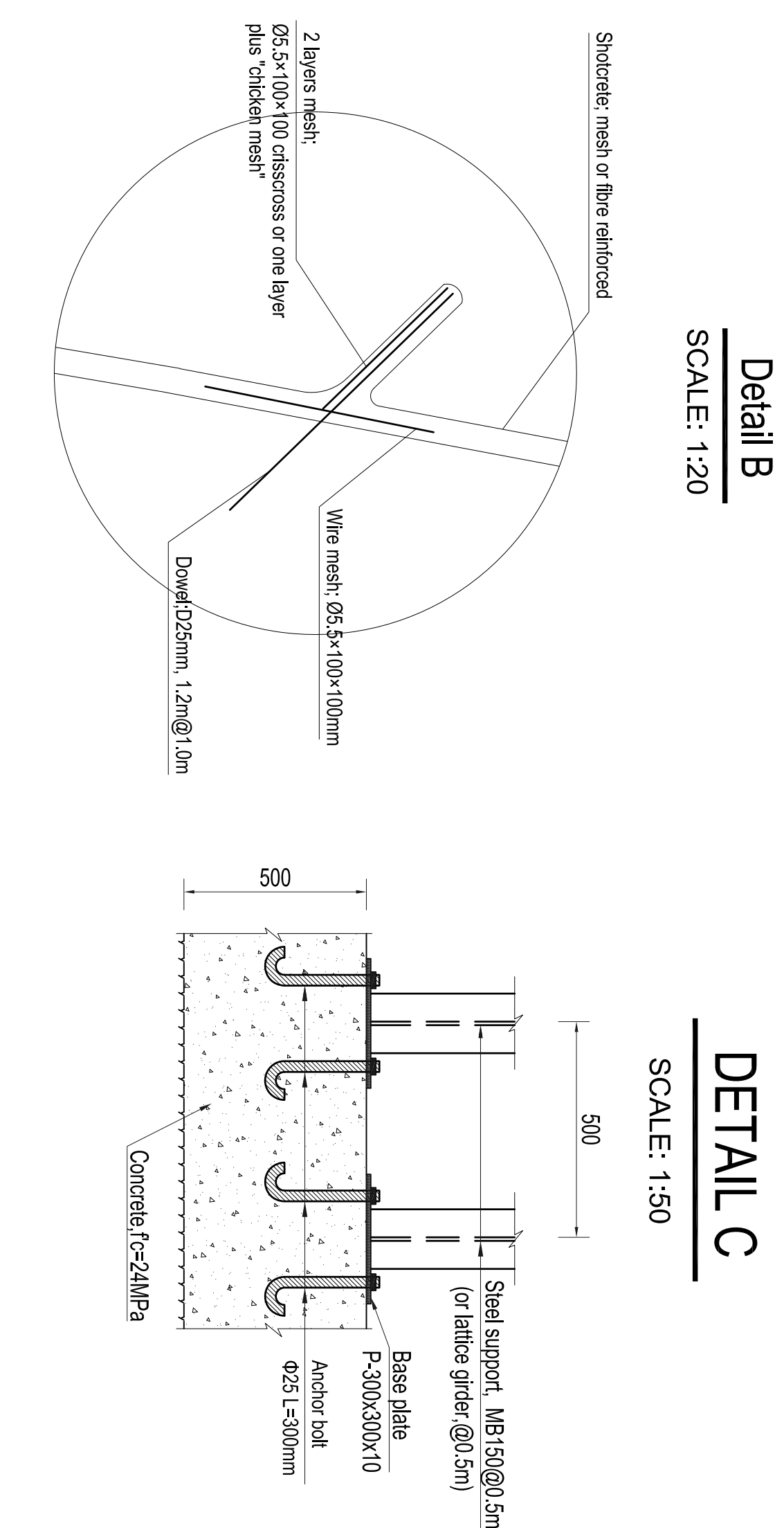
SCALE: 1:100



SUPPORT TYPE OF TUNNEL ENTRANCE SECTION

(A3+001.220~A3+008.220)

SCALE 1:50



NOTE

NOTE

1. This set of drawings are the excavation and initial support of adit No.3.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. The thickness of concrete cover is 50mm.
4. Symbol description:

A-Line is the design excavation line.

B-Line is the overbreak line.

R-denotes round bar, yield strength of the round bar is 280MPa.

D-denotes deformed bar, yield strength of the deformed bar is 500 MPa;

5.Strength specification of concrete & shotcrete

(1) Concrete class E: Cylinder specified compressive strength 24MPa at 28 days.

(2) Concrete class C: Cylinder specified compressive strength 12MPa at 28 days.

(3) Shotcrete: Cylinder specified compressive strength 25MPa at 28 days except specified.

6. Other notes see sheet 1.

REFERENCE DRAWINGS	
U17-C-190-OL-DC-4002	Surrounding Rock Stability Calculation of Aftt NO.3
U17-C-000-OL-DC-40001-01-05	Partial Design Drawing of Excavation and Support for Underground Rooms
U17-C-456-OL-DC-20005	Layout Drawing of Watering for Aftt NO.3
U17-C-190-OL-DC-4009	Planing of construction of NO.3 roadway

SYMBOL AND LEGEND

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E	21	21.JUN.2022	FOR APPROVAL	DONE Z.Z.	Lei Y.G.	Hon J.B.
D	10	10.06.2021	FOR APPROVAL	DONE Z.Z.	Lei Y.G.	Hon J.B.
C	10	10.05.2021	FOR APPROVAL	DONE Z.Z.	Lei Y.G.	Hon J.B.
B	25	25.JUL.2021	FOR APPROVAL	DONE Z.Z.	Lei Y.G.	Hon J.B.
A	25	25.JUN.2021	FOR APPROVAL	DONE Z.Z.	Lei Y.G.	Hon J.B.

PROJECT TITLE

Upper Trishuli-1 HEP (216MW)

OWNER



OWNER'S ENGINEER



CONTRACTOR

DOOSAN Doosan Heavy Industries & Construction

DRAFTING TIT

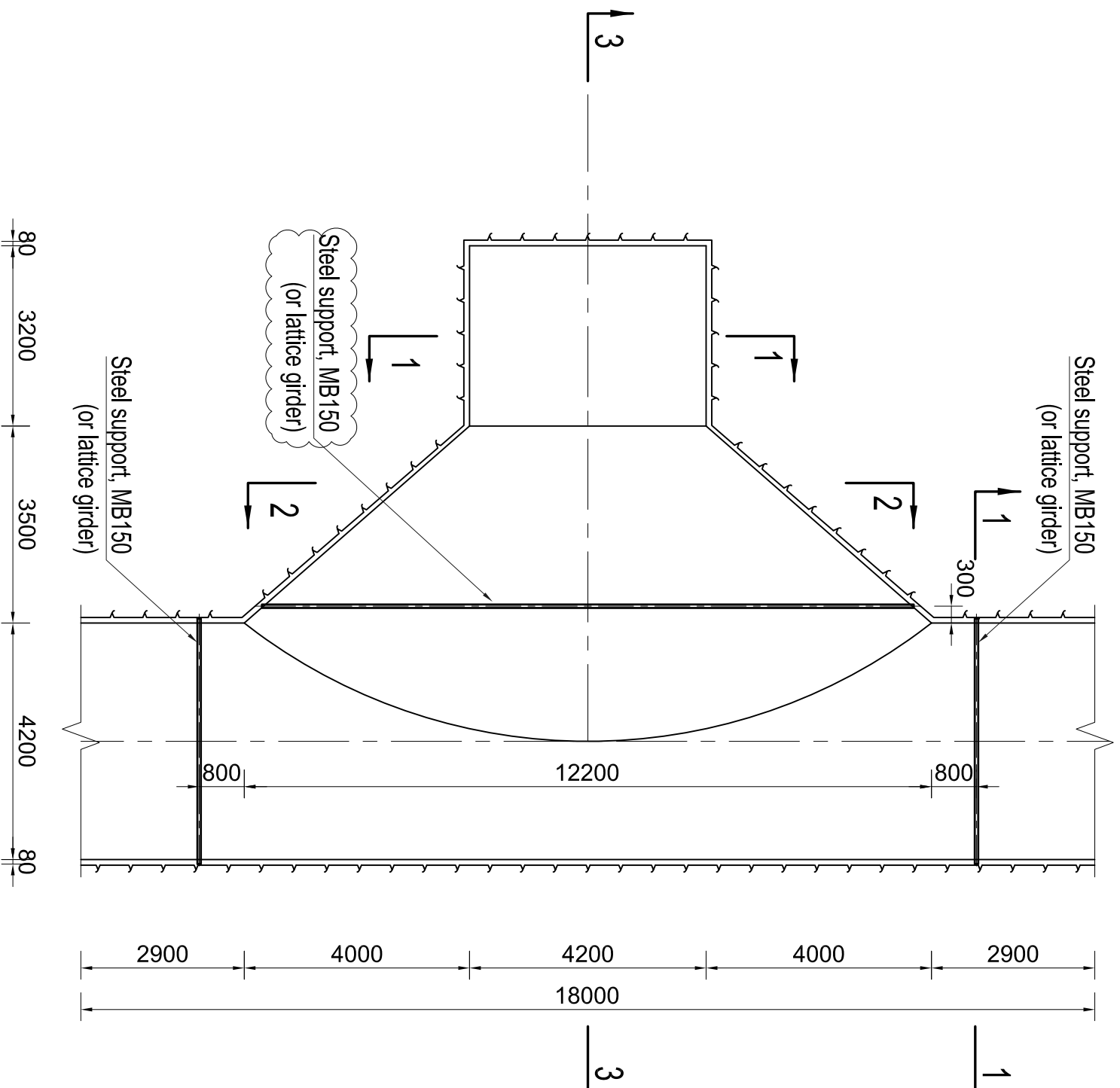
EXCAVATION AND INITIAL SUPPORT DRAWINGS
OF ADIT NO.3 (2/5)

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CVL-DG-43004	2 OF 5	F

A1 (594 × 841 MM) 1

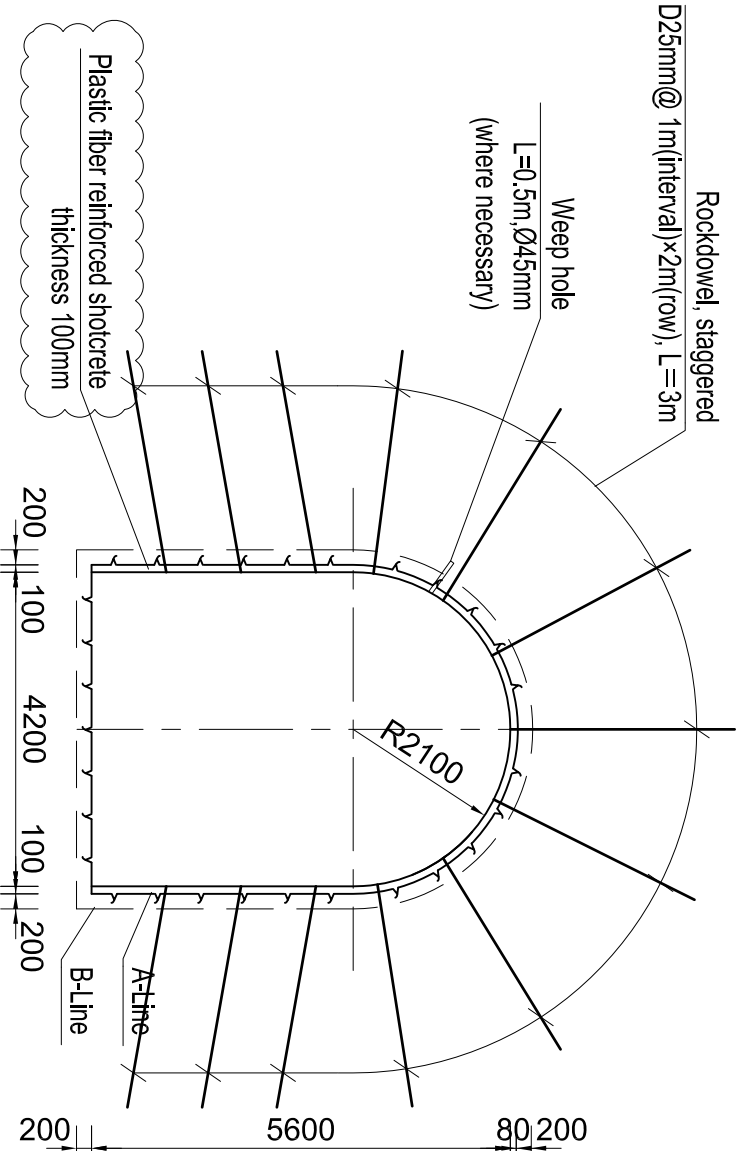
PLAN OF TURNING ADIT (ROCK CLASS III)

SCALE 1:100



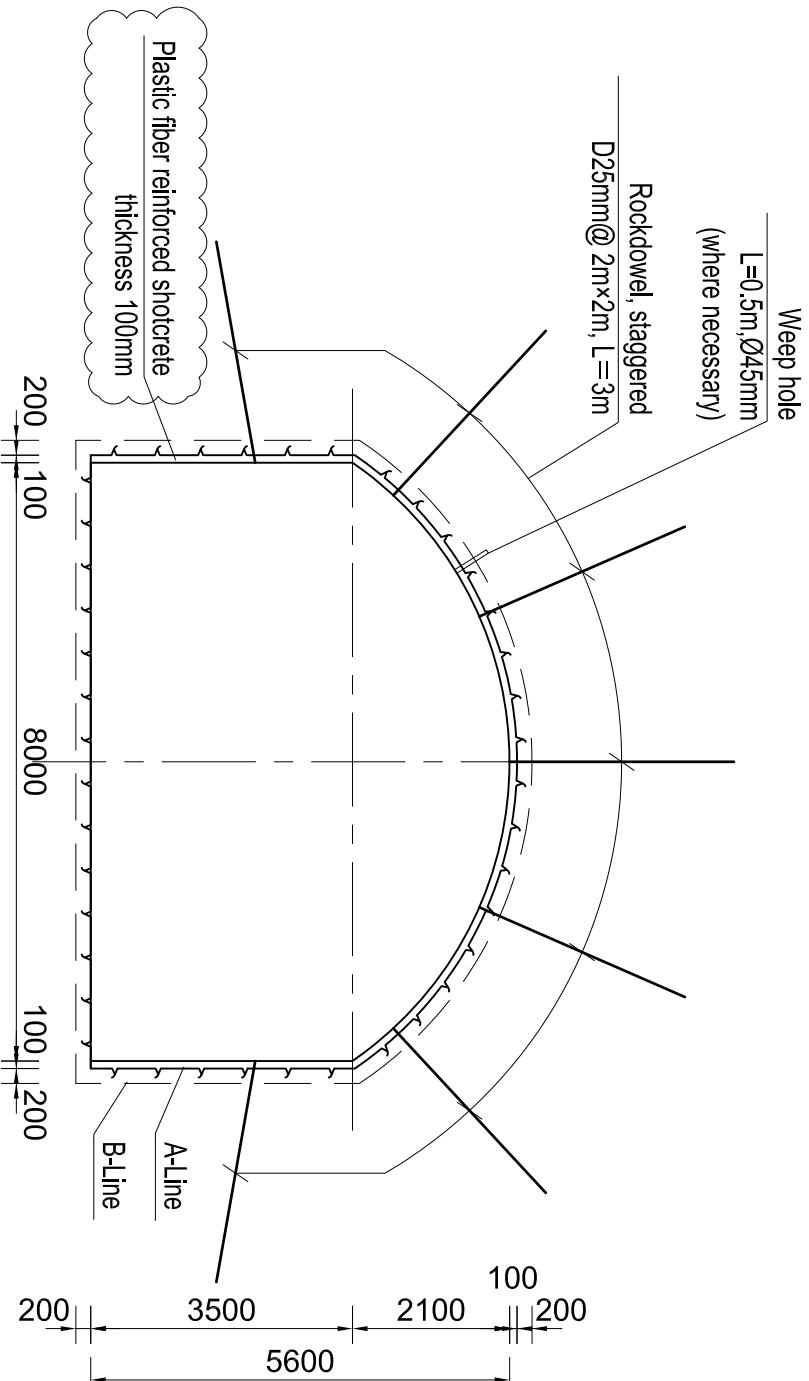
SECTION 1-1

SCALE 1:100



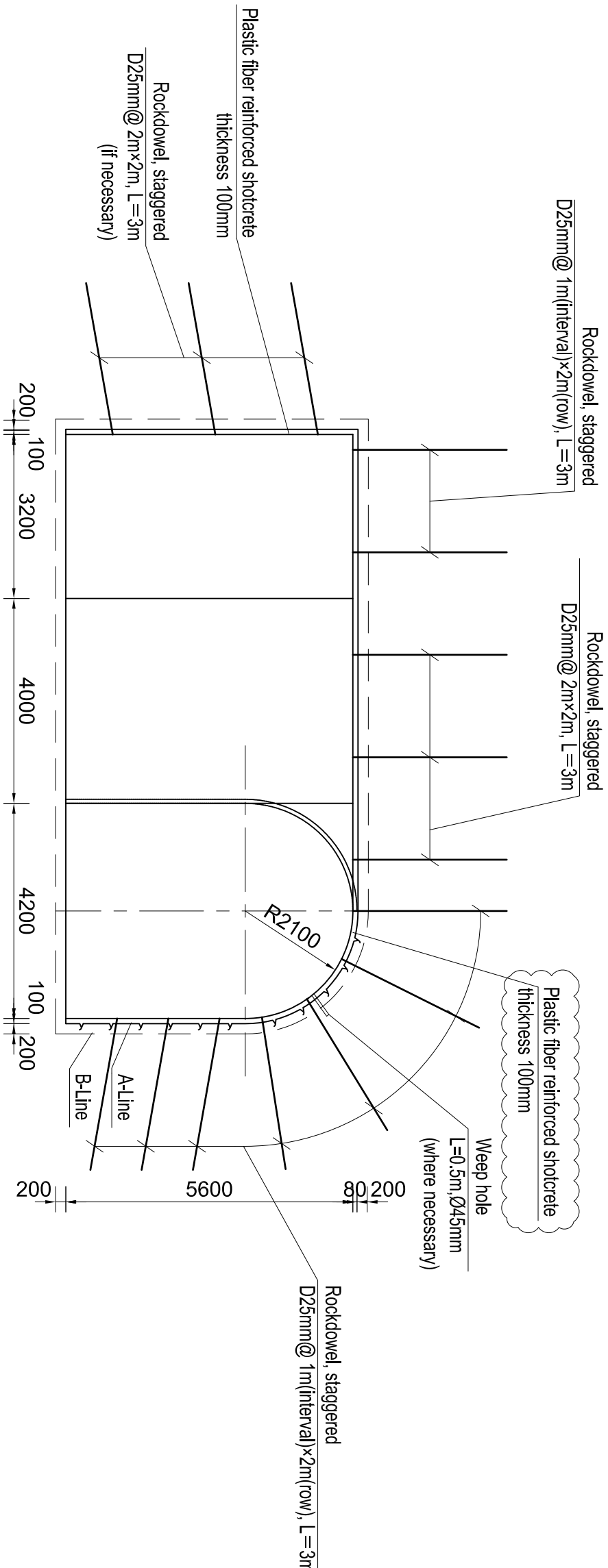
SECTION 2-2

SCALE 1:100



SECTION 3-3

SCALE 1:100

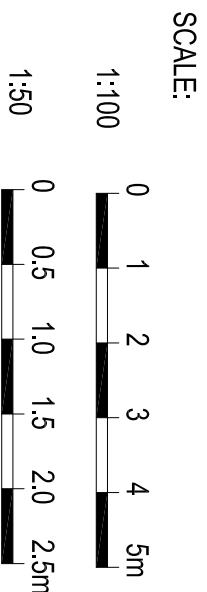


TUNNEL SUPPORT PATTERN

	Class I	Class II	Class III	Class IV	Class V
Support pattern	Q>40	10<Q<40	4<Q<10	1<Q<4	Q<1
Rock mass quality	Spot bolting D25, L=3m	Pattern bolting D25@2.5L=3m (in tunnel roof)	Pattern bolting D25@2.0m, L=3m (alternative)	Pattern bolting D25@1.5m, L=3m (alternative)	Pattern bolting D25@1.0m, L=3m (alternative)
Rock dowel	-	T=50mm(PFRS)	T=100mm(PFRS)	T=100mm(PFRS)	T=160mm(PFRS)
Shotcrete	-	-	-	MB150@1.0m or (lattice girder @1m) (where necessary)	MB150@1.0m or (lattice girder @1m) (where necessary)
Steel support	-	-	-	Foreroping grouted dowel D25@0.4m, L=6m (where necessary)	Foreroping grouted dowel D25@0.4m, L=6m
Supplementary support	-	-	-	-	-
Unsupported span for shotcrete(m)	-	9	2	1.5	0.5~1.0
Unsupported span for rock dowel(m)	-	6	4	3	0.5~1.0
Unsupported span for steel support(m)	-	-	-	0.5~1.0	0.5~1.0
Excavation span(m)	3	3	2	1.0~1.5	0.5~1.0
Excavation method	Blasting/Mechanically				Mechanically

NOTE

1. This set of drawings are the excavation and initial support of adit No.3.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. Other notes see sheet 1.



REFERENCE DRAWINGS

UT1-C-150-CUL-00-43002	Surveying Rock Stability Calculation of Adit No.3
UT1-C-000-CUL-00-4000-00-405	Defined Design Drawing of Excavation and Support for Underground System
UT1-C-845-CUL-00-30005	Layout Drawing of Ventilation for Adit No.3
UT1-C-150-CUL-00-43009	Drawing of construction pit No.3 piling

SYMBOL AND LEGEND

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PROJECT TITLE

Upper Trishuli-1 HEP (216MW)

OWNER



OWNER'S ENGINEER



CONTRACTOR

DOOSAN Doosan Heavy Industries & Construction

DRAWING TITLE

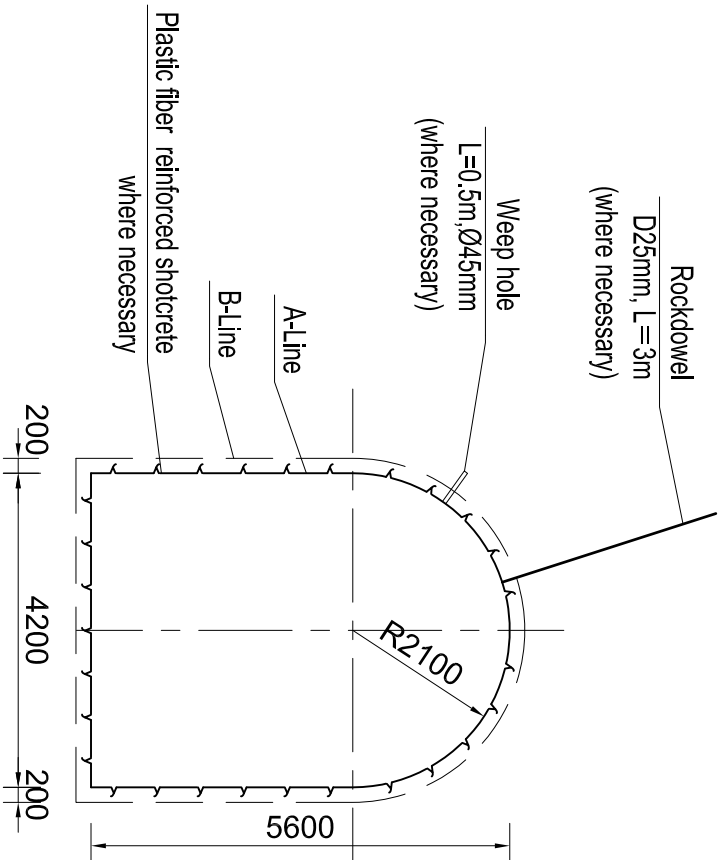
EXCAVATION AND INITIAL SUPPORT DRAWINGS
OF ADIT NO.3 (3/5)

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CVL-DG-43004	3 OF 5	F

A1 (594 x 841 MM)

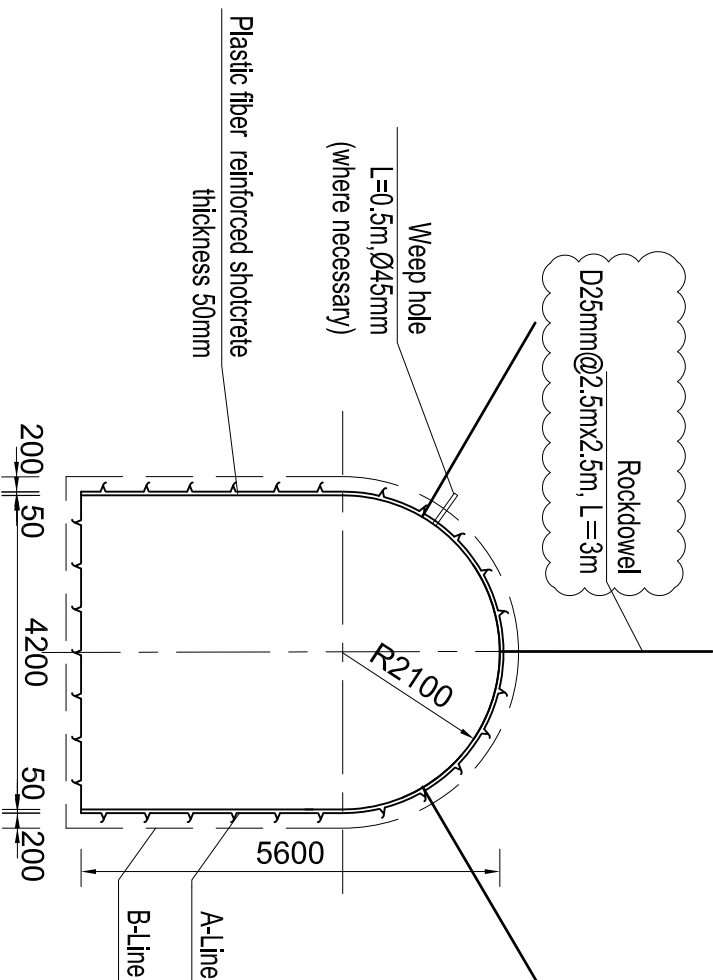
SUPPORT TYPE OF ROCK CLASS I

SCALE 1:100



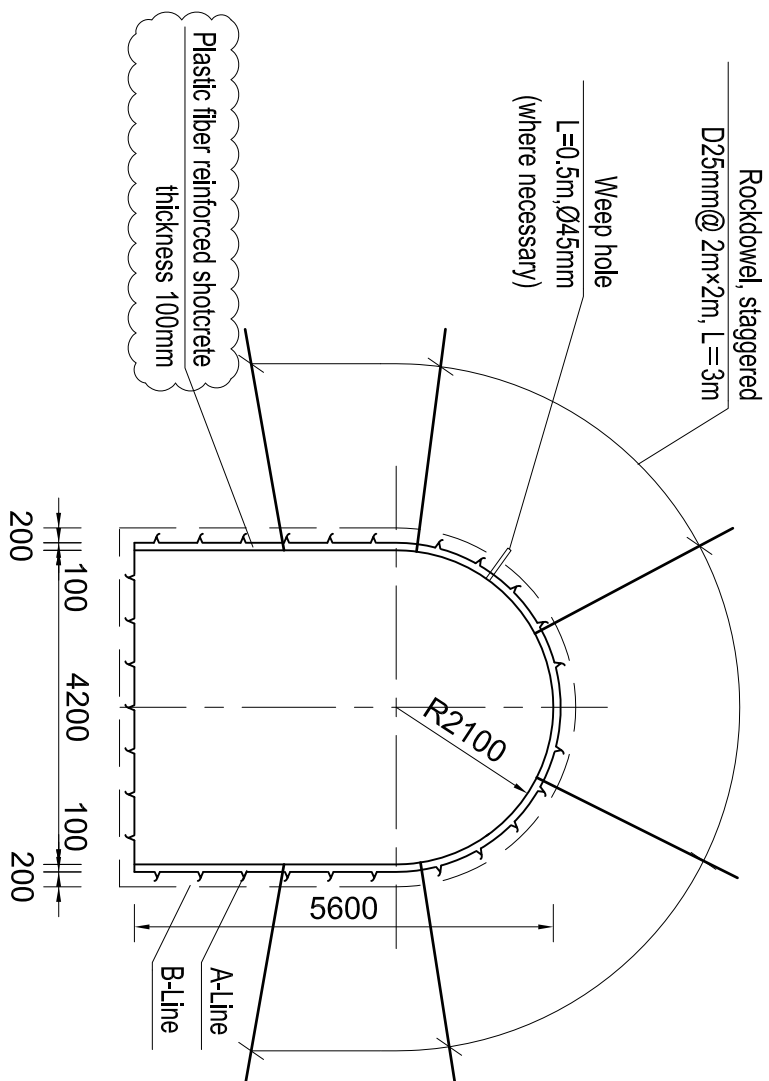
SUPPORT TYPE OF ROCK CLASS II

SCALE 1:100



SUPPORT TYPE OF ROCK CLASS III

SCALE 1:100



SUPPORT TYPE OF ROCK CLASS IV

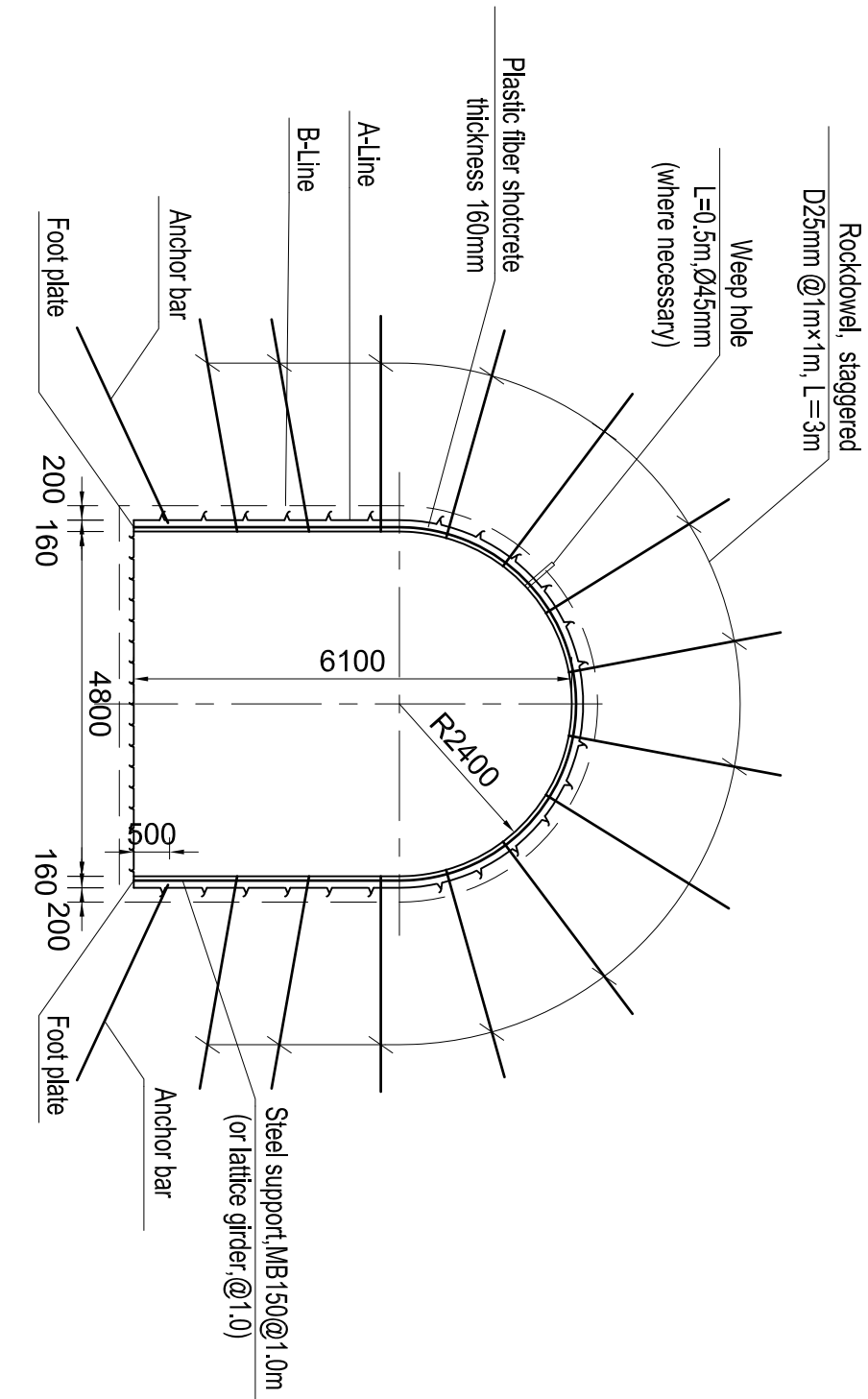
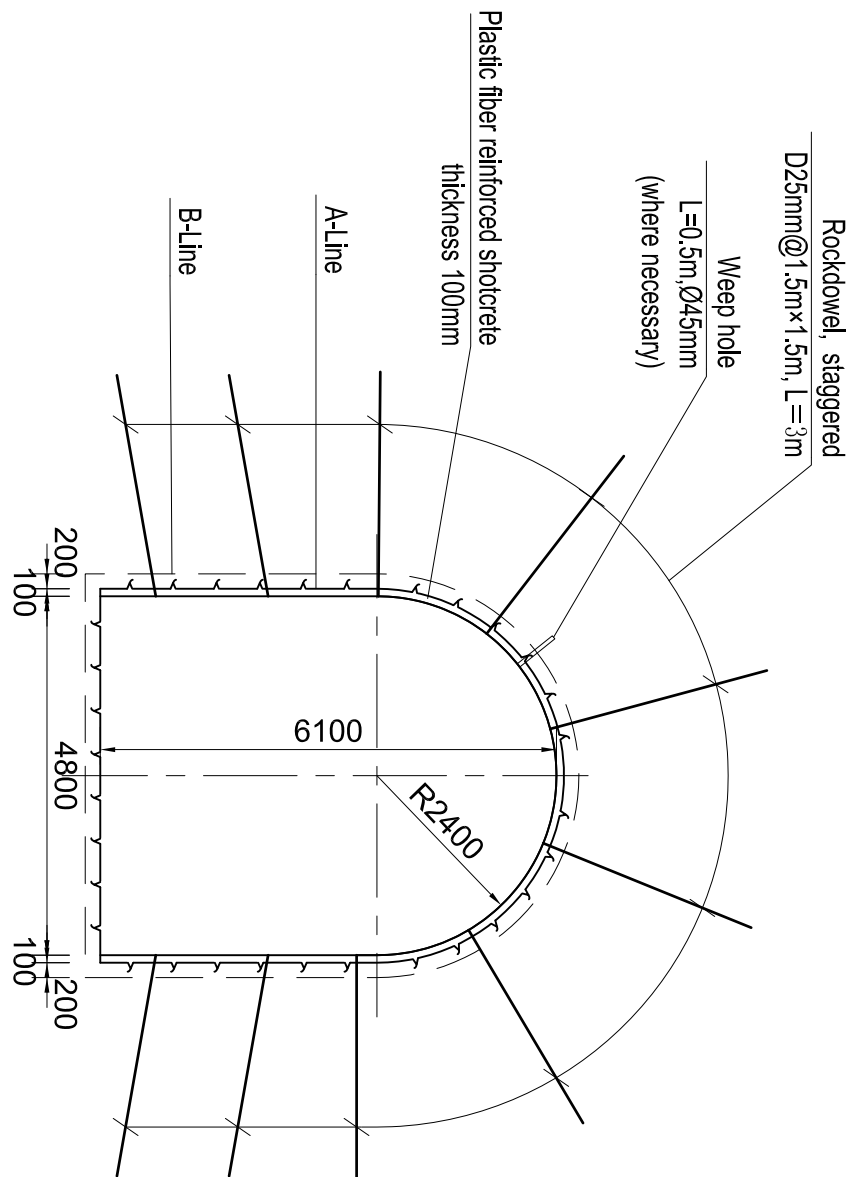
SCALE 1:100

Buried Depth (m)	<=100	150	200
Plastic Fiber Shotcrete Thickness(mm)	100	120	160
Rock dowel	Pattern bolting D25@1.5L=3m Staggered	Pattern bolting D25@1.0L=3m Staggered	Pattern bolting D25@1.0L=3m Staggered
Shotcrete Strength(MPa)	25	30	30
Steel support	-	-	MB150@1.0m or (lattice girder@1m)

SUPPORT PARAMETERS OF CLASS IV

ACROSS SECTION OF FOREPOLING

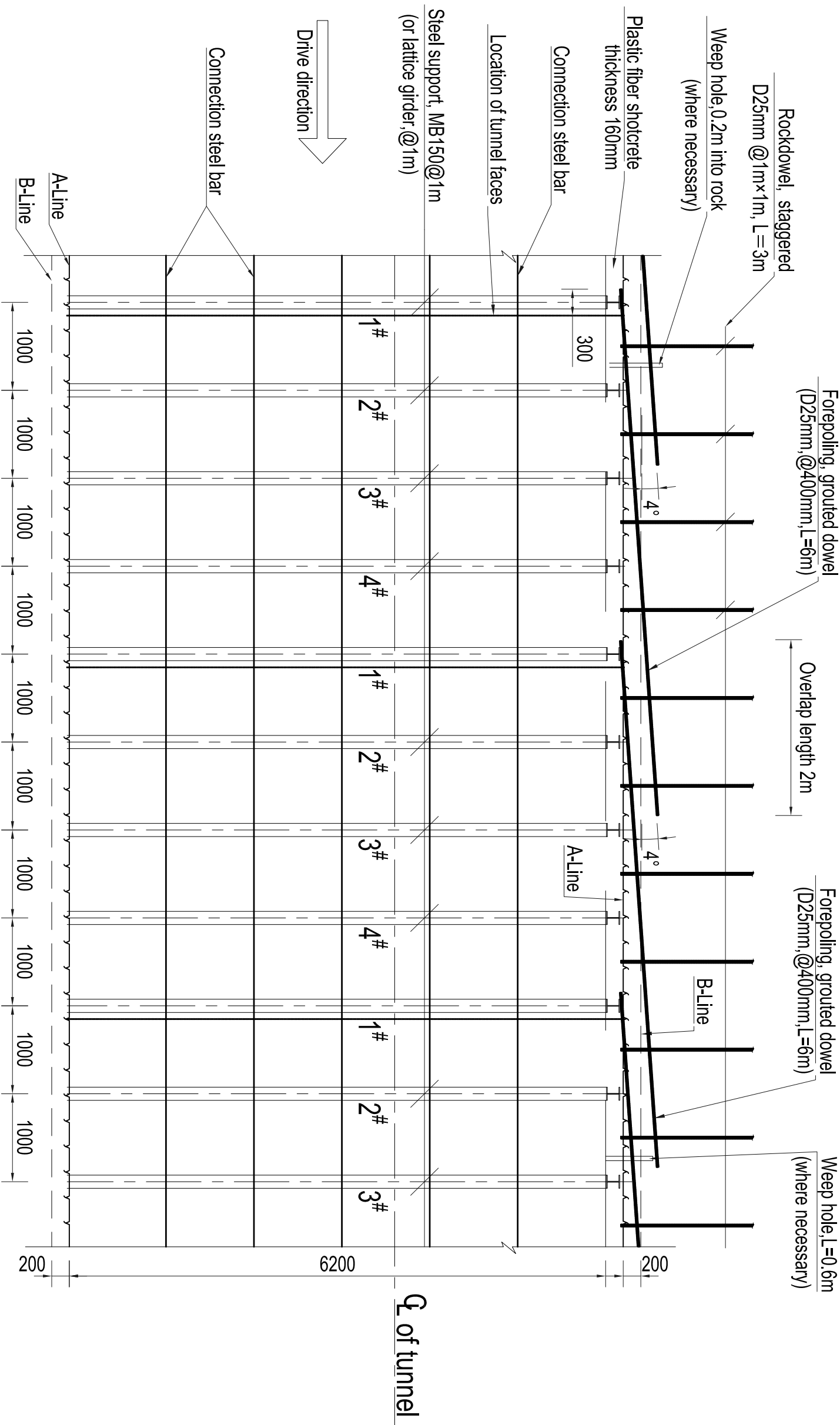
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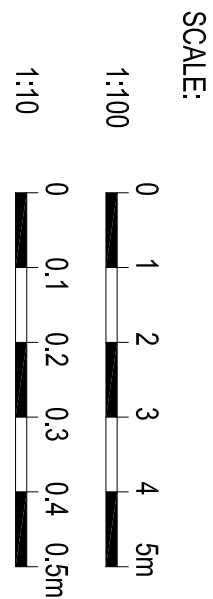
LONGITUDINAL PROFILE OF FOREPOLING

Applied to class V

SCALE 1:50



1. This set of drawings are the excavation and initial support of adit No.3.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. The canopy forepoling is mainly used in the tunnel section with poor surrounding rock geology, which should be used together with dowel and steel support (or lattice girder), and the spacing of dowel should be consistent with that of steel support.
4. The steel support (or lattice girder) to rock class IV is subjected to the exposed geological condition.
5. The excavation profile may need to be adjusted to a "saw-tooth profile" and size of ribs/girders may also be adjusted.
6. Other notes see sheet 1 & sheet 2.



REFERENCE DRAWINGS

UT1-C-150-CM-00-43002	Surrounding Rock Stability Evaluation of Adit No.3
UT1-C-000-0M-00-4000-00-405	Detailed Design Drawing of Excavation and Support for Underground System
UT1-C-045-CM-00-30005	Layout Drawing of Lining (for Adit No.3)
UT1-C-150-CM-00-40009	Drawing of construction oil NO.3 plugging

SYMBOL AND LEGEND

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Upper Trishuli-1 HEP (216MW)



OWNER'S ENGINEER



CONTRACTOR

DOOSAN Doosan Heavy Industries & Construction

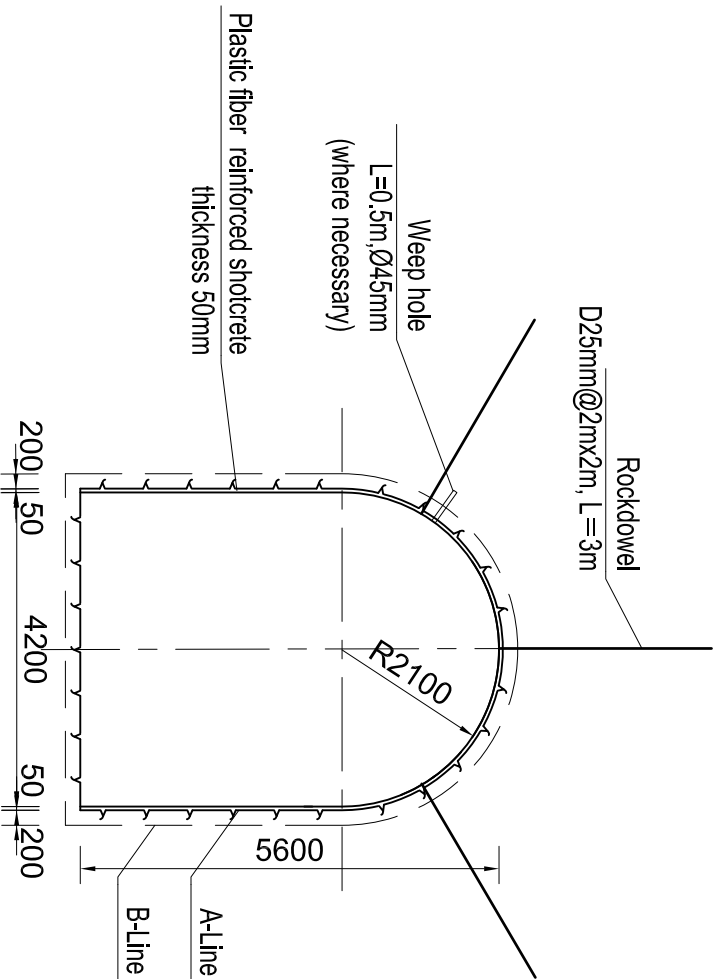
DRAWING TITLE
EXCAVATION AND INITIAL SUPPORT DRAWINGS
OF ADIT NO.3 (4/5)

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CVL-DG-43004	4 OF 5	F

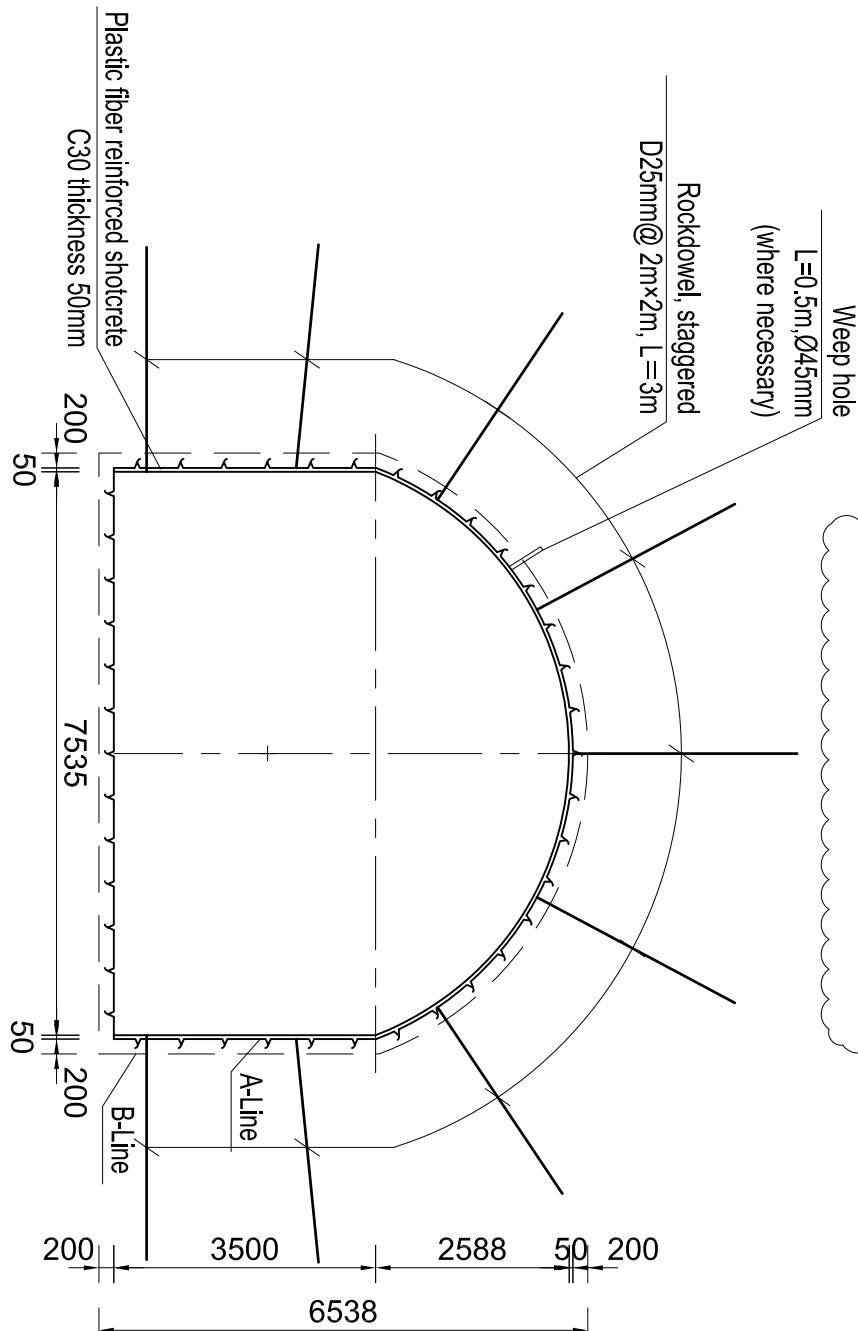
NOTE

1. This set of drawings are the excavation and initial support of adit No.3.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. Other notes see sheet 1 & sheet 2.

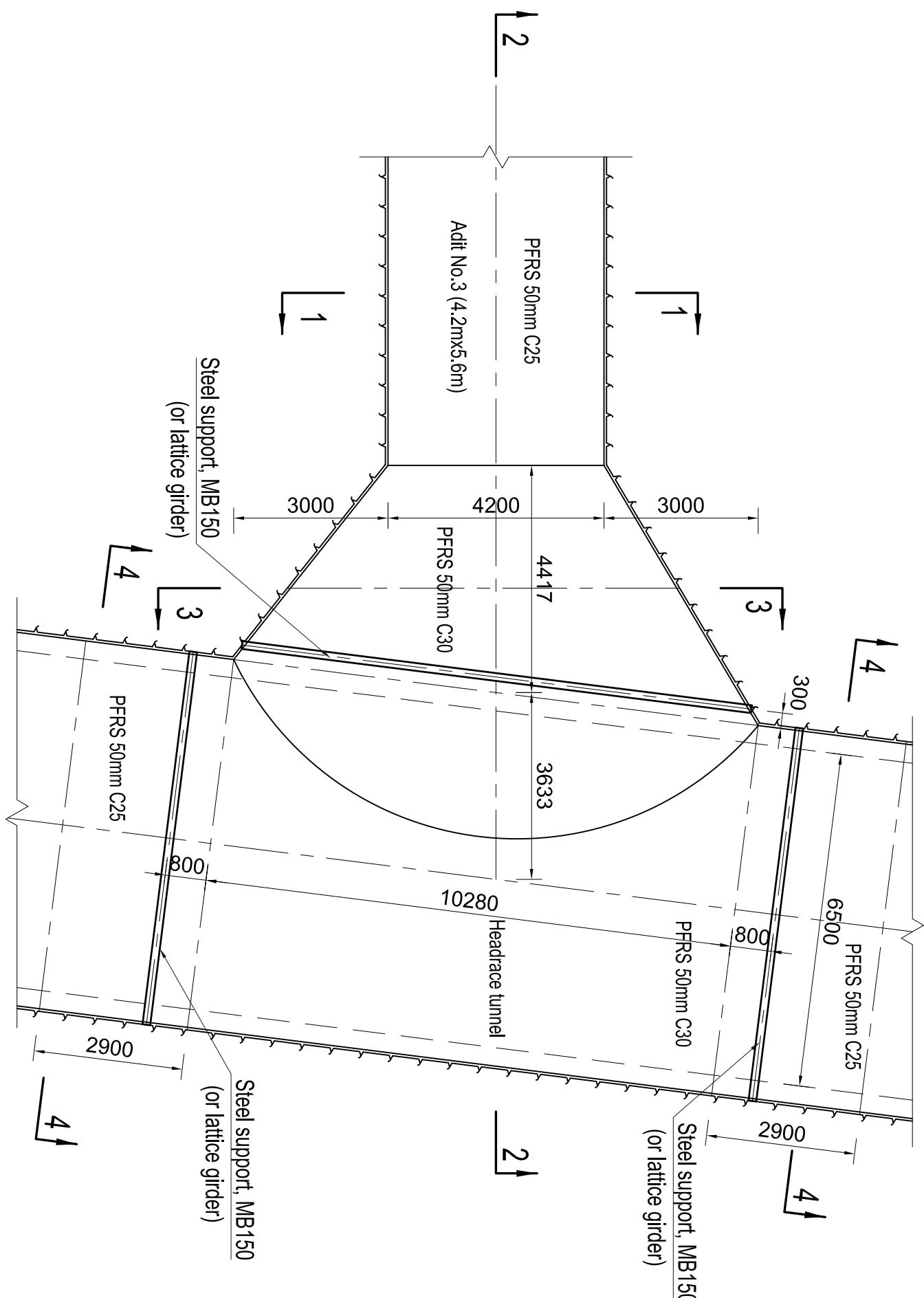
SECTION 1-1
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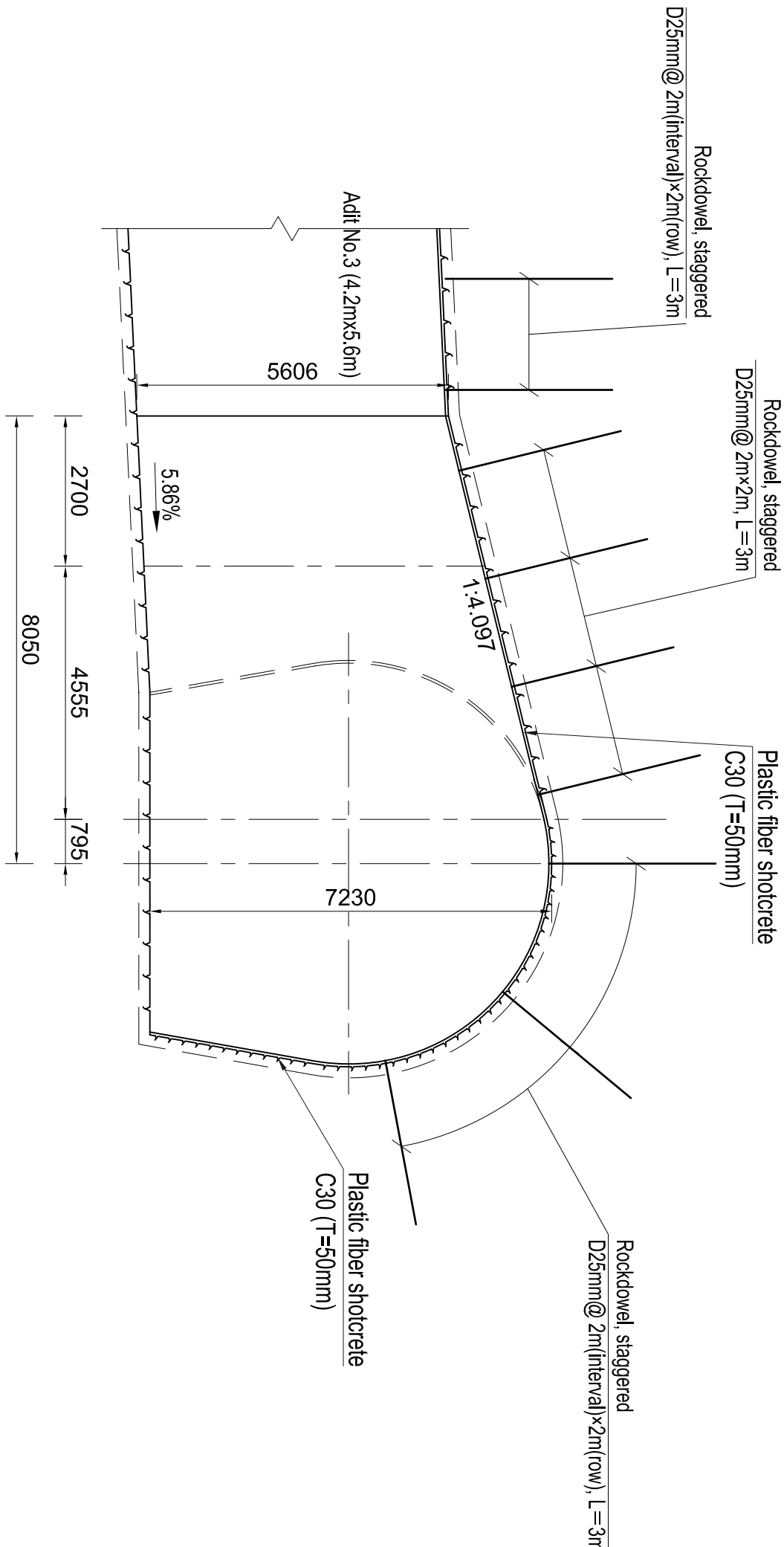
SECTION 3-3
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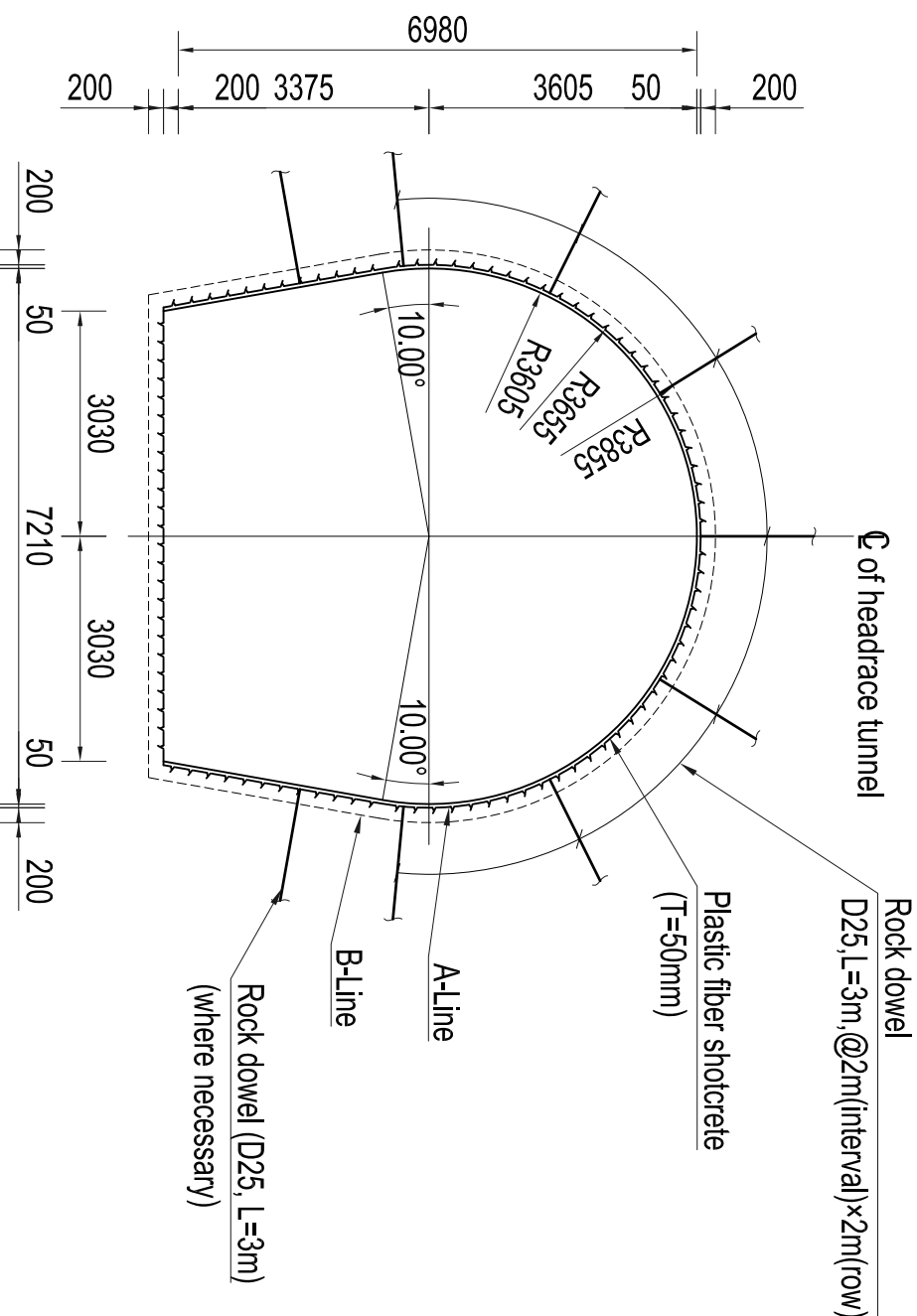
SECTION 2-2
SCALE 1:100



SECTION 2-2
SCALE 1:100



SECTION 4-4
SCALE 1:100



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A	25.MAY. 2021	FOR APPROVAL	DONG Z.Z.	LA Y.G.	HEO J.B.

PROJECT TITLE
Upper Trishuli-I HEP (216MW)



CONTRACTOR
DOOSAN Doosan Heavy Industries & Construction

DRAWING TITLE
EXCAVATION AND INITIAL SUPPORT DRAWINGS
OF ADIT NO.3 (5/5)

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CVL-DG-43004	5 OF 5	F